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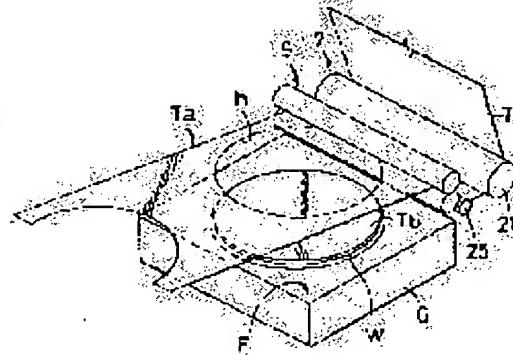
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(54) ADHESIVE TAPE STICKING/PEELING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To peel an adhesive tape stably and smoothly without leaving a sticker component by forming the surface of a member located around an article into an nonadhesive face.

SOLUTION: A nonadhesive process is applied to a surface F where an excess adhesive tape Ta is stuck, i.e., a table surface F on the outside of a tape cut groove 17, to form a nonadhesive face. This nonadhesive face is formed so that the peeling force when the excess adhesive tape Ta is peeled off preferably becomes 10 g/10 mm width or below. A mold releasing agent of silicon or fluorine is applied, or a coating is stuck to form the nonadhesive layer as the nonadhesive process for forming the table surface F into the nonadhesive face. These methods are properly selected according to the using conditions such as the adhesive strength of the adhesive tape T or the adhesive area of the excess adhesive tape Ta against the table surface.



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CLAIMS

[Claim(s)]

[Claim 1] Adhesive tape attachment exfoliation equipment characterized by to constitute the front face of the member located in the perimeter of said goods in the difficulty adhesion side in the adhesive tape attachment exfoliation equipment constituted so that the excessive adhesive tape stuck on the front face of the member located in the perimeter of goods might be exfoliated, after covering goods and the member located in the perimeter and sticking adhesive tape.

[Claim 2] Said difficulty adhesion side is adhesive tape attachment exfoliation equipment whose tape exfoliation force in an adhesive tape exfoliation process is below 10g/10mm width of face in adhesive tape attachment exfoliation equipment according to claim 1.

[Claim 3] Adhesive tape attachment exfoliation equipment which performs processing in which it does not adhere to the front face of the member located in the perimeter of said goods, and has formed the difficulty adhesion side in it in adhesive tape attachment exfoliation equipment according to claim 1 or 2.

[Claim 4] Adhesive tape attachment exfoliation equipment which makes a coarse side the front face of the member located in the perimeter of said goods in adhesive tape attachment exfoliation equipment according to claim 1 or 2, and has formed the difficulty adhesion side.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] After this invention covers goods and the member of that perimeter and sticks adhesive tape, it relates to the adhesive tape attachment exfoliation equipment constituted so that the excessive adhesive tape stuck on the front face of the member located in the perimeter of goods might be exfoliated.

[0002]

[Description of the Prior Art] For example, in semi-conductor manufacture, in case the rear face of semi-conductor substrates, such as a silicon wafer, is ground (back grinding), there is a stroke which sticks adhesive tape for protection of a substrate front face. Adhesive tape is stuck on a substrate, and subsequently, after that, to the attachment preparation sake for the following substrate, it cuts around a substrate, and it is in the condition which turns a front face upward, supplied the substrate on the substrate support table and carried out adsorption maintenance in the attachment stroke of this adhesive tape for protection, and rolls [adhesive tape is cut in accordance with the periphery configuration of a substrate and / fixed die length is covered / **** / in **** surplus adhesive tape, and] round. In this case, since adhesive tape will be stuck also on the table front face which is the member located in the perimeter of a substrate in connection with sticking adhesive tape on the substrate on a table, surplus adhesive tape will be rolled round, exfoliating from a table front face.

[0003]

[Problem(s) to be Solved by the Invention] Adhesive tape was stuck on the substrate on a table as mentioned above, and there were the following troubles in the process which rolls round surplus adhesive tape. Namely, since the surplus adhesive tape rolled round serves as a configuration which has the large clipping hole cut in accordance with the substrate configuration, and was connected in both the side side of a clipping hole only in the side side where width of face is narrow When adhesion with surplus adhesive tape and a table front face was strong, rolling up which surplus adhesive tape was prolonged and was stabilized becomes impossible, or the binder component of surplus adhesive tape might remain on the surface of the table, and it might become the failure of future tape attachment and exfoliation.

[0004] This invention is made paying attention to such a situation, and aims at being stabilized and enabling it to exfoliate smoothly the excessive adhesive tape stuck on the member around goods, without making a binder component remain.

[0005]

[Means for Solving the Problem] This invention takes the following configurations, in order to attain the above-mentioned purpose. That is, after invention concerning claim 1 covers goods and the member located in the perimeter and sticks adhesive tape, it is characterized in the adhesive-tape attachment exfoliation equipment constituted so that the excessive adhesive tape stuck on the front face of the member located in the perimeter of goods might be exfoliated by to constitute the front face of the member located in the perimeter of said goods in the difficulty adhesion side.

[0006] Invention concerning claim 2 is characterized by the tape exfoliation force in an adhesive

tape exfoliation process of said difficulty adhesion side being below 10g/10mm width of face in adhesive tape attachment exfoliation equipment according to claim 1.

[0007] In invention according to claim 1 or 2, invention concerning claim 3 performs processing in which it does not adhere to the front face of the member located in the perimeter of said goods, and has formed the difficulty adhesion side in it.

[0008] In invention according to claim 1 or 2, invention concerning claim 4 makes a coarse side the front face of the member located in the perimeter of said goods, and has formed the difficulty adhesion side.

[0009]

[Function] The operation of this invention is as follows. Since the front face of the member which faces the surplus adhesive tape which became unnecessary from the front face of the member located in the perimeter of a substrate to exfoliating, and is located in the perimeter of a substrate is constituted by the difficulty adhesion side after according to adhesive tape attachment exfoliation equipment according to claim 1 covering a substrate and the member located in that perimeter and sticking adhesive tape, the surplus adhesive tape stuck on this member front face exfoliates smoothly, without extending by force. Moreover, it becomes, without a binder component remaining on the front face of the member located in the perimeter of a substrate.

[0010] Since the front face of the member located in the perimeter of a substrate is constituted by the difficulty adhesion side where the tape exfoliation force becomes below about 10g / 10mm width of face according to adhesive tape attachment exfoliation equipment according to claim 2, surplus adhesive tape can be exfoliated still more smoothly.

[0011] According to adhesive tape attachment exfoliation equipment according to claim 3, the release agent of a silicon system or a fluorine system can be applied coated, or processing on the front face of a member in which it does not adhere can be performed by sticking the sheet of a fluororesin or silicone rubber and forming a non-adhesive layer, for example. Moreover, if non-adhesiveness ability falls, it is also possible to restore the engine performance by performing again processing in which it does not adhere.

[0012] According to adhesive tape attachment exfoliation equipment according to claim 4, a difficulty adhesion side can be formed in a goods front face by performing mechanical processing of press working of sheet metal or cutting.

[0013]

[Embodiment of the Invention] One example which applied this invention to the equipment for sticking the adhesive tape for protection on a substrate front face hereafter as a last process of the back grinding process of the semi-conductor substrate (goods) W is explained with reference to a drawing.

[0014] The front view whole equipment showing [this] at least the function part in drawing 1 at drawing 2 is shown, respectively. As shown in drawing 1 and 2, this adhesive tape attachment exfoliation equipment The substrate W before back grinding Cassette C1 which carried out laminating receipt The substrate feed zone 1 with which it is loaded, the conveyance device 3 in which the robot arm 2 was equipped, the alignment stage 4 which carries out alignment of the substrate W, the tape feed zone 5 which supplies adhesive tape T to tape attachment / exfoliation part, and the substrate W by which installation supply was carried out It cuts around the tape attachment unit 7 which sticks adhesive tape T on the substrate W on the substrate support table 6 which carries out adsorption maintenance, and the substrate support table 6, the tape cutting equipment 8 which cuts stuck adhesive tape T in accordance with the periphery configuration of Substrate W, and Substrate W. In **** the **** surplus tape Ta Cassette C2 for carrying out the laminating receipt of the tape stripping section 10 which rolls round and collects the exfoliating tape exfoliation unit 9 and the exfoliative surplus tapes Ta, and the processed substrate W It becomes independent about the substrate stripping section 11, the tape attachment unit 7, and the tape exfoliation unit 9 with which it is loaded. It has the structure where the unit migration device 12 which carries out both-way migration was arranged by right and left in the upper part of a pedestal 13.

[0015] Said substrate feed zone 1 is a cassette C1 about Substrate W at the horizontal position

which turned the front face upward. The substrate stripping section 2 is a cassette C2 at a horizontal position similarly about the substrate W with which laminating receipt was carried out and resist removal processing ended. Laminating receipt is carried out.

[0016] The robot arm 2 of said conveyance device 3 is constituted possible [a level attitude and revolution], and performs taking out of the processed substrate W from the ejection of Substrate W, supply of Substrate W on the alignment stage 4, carrying in of the substrate W from the alignment stage 4 to the substrate support table 6, and the substrate support table 6, carrying in to the substrate stripping section 11 of the processed substrate W, etc. from the substrate feed zone 1.

[0017] Said tape feed zone 5 is constituted so that adhesive tape T which exposed the adhesive face may be led to an inferior surface of tongue through the upper part of the substrate support table 6 even at the tape attachment unit 7 and the tape exfoliation unit 9, while exfoliating and rolling round and collecting Separators s from the tape Ts with a separator drawn from the original fabric roll R.

[0018] As shown in drawing 3 and drawing 4 , the adsorption slot 16 for carrying out vacuum adsorption and holding the substrate W laid in the table top face, while the vacuum devices outside drawing are equipped with the adsorption pad 14 by which free passage connection was made possible [**** rise and fall] in a cylinder 15 is formed in the core of the substrate support table 6, and free passage connection is made at the vacuum devices outside drawing. Moreover, the slot 17 for tape cutting corresponding to the periphery configuration of the laid substrate W is annularly formed in the table top face.

[0019] The tape attachment unit 7 the movable base 22 equipped with the attachment roller 21 It is constituted so that both-way migration may be carried out by fixed stroke at a right-and-left horizontal with the delivery screw 24 by which a forward reverse drive is carried out by the motor 23. Moreover, the tape exfoliation unit 9 In the tape attachment unit 7, it is constituted by the delivery screw which arranged the movable base 26 equipped with the exfoliation roller 25 under said delivery screw 24 and which is not illustrated so that both-way migration may be carried out independently by fixed stroke at a right-and-left horizontal.

[0020] Each part of the adhesive tape attachment exfoliation equipment concerning this invention is constituted as mentioned above, and it explains the process which sticks the adhesive tape for protection on a substrate W front face below, referring to drawing 5 – drawing 10 .

[0021] first, the robot arm 2 -- cassette C1 of the substrate feed zone 1 from -- one-sheet adsorption maintenance is carried out, Substrate W is taken out, it transfers on the alignment stage 4, and alignment of Substrate W is performed here based on detection of the orientation flat of Substrate W, or a notch. The substrate W with which alignment was performed is again supported by the robot arm 2, and is supplied on the substrate support table 6.

[0022] After the substrate W carried in on the substrate support table 6 is received by the adsorption pad 14 projected on the table, it is laid in the top face of the substrate support table 7 with descent of the adsorption pad 14 in a predetermined posture and a predetermined location, and adsorption maintenance of the front face is carried out with a upward posture.

[0023] After loading of the substrate W to the substrate support table 6 top is completed, as shown in drawing 5 and drawing 7 , the tape attachment unit 7 carries out advance migration, the attachment roller 21 carries out rolling migration of the substrate support table 6 and Substrate W top, and adhesive tape T is stuck on the front face of Substrate W.

[0024] After attachment of adhesive tape T on the front face of Substrate W is completed, the tape cutting equipment 8 which was in the upper part position in readiness descends, and as shown in drawing 8 , while cutter 8a maintains the condition of having made the edge of a blade rushing into the tape cutting slot 17 on the substrate support table 6, it rotates in accordance with the periphery configuration of Substrate W, and adhesive tape T is cut in accordance with the periphery configuration of Substrate W.

[0025] Subsequently, while tape cutting equipment 8 carries out a return rise to the original position in readiness, the tape exfoliation unit 9 starts advance migration, and as shown in drawing 9 , surplus adhesive tape Ta in which the clipping hole h of a configuration in alignment

with the appearance of Substrate W was formed because the exfoliation roller 25 carries out rolling migration of the substrate support table 6 and Substrate W top exfoliates from the top face of the substrate support table 6.

[0026] If the tape exfoliation unit 9 reaches a stroke end, as shown in drawing 6 and drawing 10, in the front face of Substrate W, masking tape Tb of a configuration in alignment with the periphery configuration will be in the condition of having been stuck and left behind.

[0027] Then, while taking out of the substrate W with which masking tape Tb was stuck is performed, rolling-up recovery of rollback migration of the tape attachment unit 7 and the tape exfoliation unit 9 and surplus adhesive tape Ta which exfoliated is performed. 1 time of an attachment process is completed above, and it will be in the following substrate acceptance standby condition.

[0028] If the adhesive strength of the table front face F and surplus adhesive tape Ta is large when exfoliating surplus adhesive tape Ta stuck on the front face F of the substrate support table 6 in the above-mentioned tape exfoliation process Although it may be in the condition that surplus adhesive tape Ta can be prolonged and stabilized and cannot exfoliate or the binder component of surplus adhesive tape Ta may remain on the table front face F In order to prevent this, the ***** adhesive face consists of this inventions for processing in which it does not adhere, on said front face F F, i.e., the table front face in the method of outside [slot / 17 / tape cutting], on which surplus adhesive tape Ta is stuck. This difficulty adhesive face is constituted so that the exfoliation force in case surplus adhesive tape Ta exfoliates preferably may become below 10g/10mm width of face.

[0029] In addition, said exfoliation force is the value which measured the adhesive strength at the time of carrying out heating maintenance for 3 minutes in the state of 100-degreeC, and exfoliating at the exfoliation include angle of 30 degrees, after sticking the adhesive tape of 10mm width of face on adherend.

[0030] Here, as processing for making said table front face F into a difficulty adhesion side in which it does not adhere, it is good to apply coat the release agent of a silicon system or a fluorine system, or for there to be a means to stick the sheet of a fluororesin or silicone rubber and to form a non-adhesive layer etc., and to choose these suitably according to service conditions, such as adhesion area to the adhesion of adhesive tape T, or the table front face F of surplus adhesive tape Ta. Moreover, a substantial touch area with adhesive tape T is able to form said table front face F in the coarse side which has fine irregularity and a fine slot, and to constitute in few difficulty adhesion sides.

[0031] Moreover, it is also possible to constitute in the difficulty adhesion side to which a cooling system is built in the substrate support table 6, the binder which contacted is stiffened by cooling said front face F in a way outside the slot 17 for tape cutting, and adhesion is reduced.

[0032]

[Effect of the Invention] According to the adhesive tape attachment exfoliation equipment of this invention, the following effectiveness is expectable clearly from the above explanation.

[0033] After according to the adhesive tape attachment exfoliation equipment concerning claim 1 covering a substrate and the member located in the perimeter and sticking adhesive tape, Since the front face of the member located in the perimeter of a substrate is constituted by the difficulty adhesion side when exfoliating from the front face of the member located in the perimeter of a substrate, the surplus adhesive tape which became unnecessary The surplus adhesive tape stuck on this member front face can exfoliate smoothly, without it seeming that it extends by force, and the exfoliative surplus adhesive tape can be collected now stably and easily. Moreover, since it can prevent remaining a binder component on the front face of the member located in the perimeter of a substrate, when carrying out repeat attachment exfoliation processing of it, faults, such as generating of the poor attachment by the residual of a binder component, can be prevented beforehand.

[0034] Since a difficulty adhesive face is constituted that the tape exfoliation force in an adhesive tape exfoliation process is below 10g/10mm width of face according to the adhesive tape attachment exfoliation equipment especially applied to claim 2, the effect of the invention of claim 1 becomes much more remarkable.

[0035] Moreover, since according to the adhesive tape attachment exfoliation equipment concerning claim 3 processing in which it does not adhere is performed to the front face of the member located in the perimeter of goods and a difficulty adhesion side is formed in it, even if the non-adhesiveness ability on the front face of goods falls, it becomes easy to aim at engine-performance restoration by performing repeatedly processing in which it does not adhere, and it becomes the thing excellent in maintenance nature.

[0036] Furthermore, since a difficulty adhesion side can be formed in a goods front face by mechanical processing according to the adhesive tape attachment exfoliation equipment concerning claim 4, there is an advantage which is easy to carry out cheaply as compared with the case where processing in which it does not adhere is performed.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view of one example of the adhesive tape attachment exfoliation equipment concerning this invention.

[Drawing 2] It is the outline front view of the important section.

[Drawing 3] It is the vertical section front view of an attachment table.

[Drawing 4] It is the perspective view of an attachment table.

[Drawing 5] It is the front view showing an adhesive tape attachment process.

[Drawing 6] It is the front view showing an adhesive tape exfoliation process.

[Drawing 7] It is the perspective view showing the first half of an adhesive tape attachment process.

[Drawing 8] It is the perspective view showing an adhesive tape cutting process.

[Drawing 9] It is the perspective view showing the first half of the exfoliation stroke of surplus adhesive tape.

[Drawing 10] It is the perspective view showing the condition that the exfoliation process of surplus adhesive tape was completed.

[Description of Notations]

6 Member (Substrate Support Table)

F Front face

T Adhesive tape

Ta Surplus adhesive tape

W Goods (substrate)

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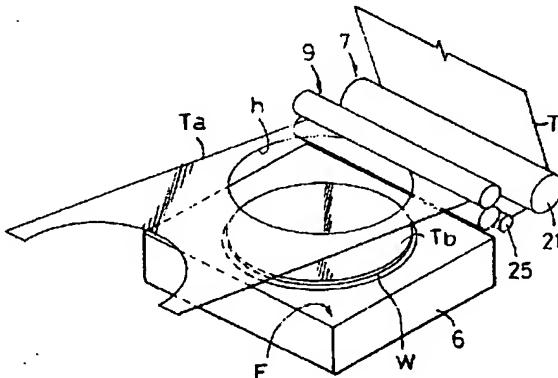
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(54)【発明の名称】 粘着テープ貼付け剥離装置

(57)【要約】

【課題】 基板とその周囲に位置するテーブル表面とに亘って粘着テープを貼付けた後、基板の周囲に位置するテーブル表面に貼付けられた余剰の粘着テープを剥離するよう構成した粘着テープ貼付け剥離装置において、物品の周囲に位置するテーブル表面に貼付けられた余剰の粘着テープを、粘着剤成分を残留させることなく、安定して円滑に剥離することができるようとする。

【解決手段】 基板Wの周囲に位置するテーブル表面Fに非粘着処理を施したり、テーブル表面Fを粗面にする等して、この表面Fを、テープ剥離力が10g/10mm幅以下となる難接着面に構成する。



【特許請求の範囲】

【請求項1】 物品とその周囲に位置する部材とに亘って粘着テープを貼付けた後、物品の周囲に位置する部材の表面に貼付けられた余剰の粘着テープを剥離するよう構成した粘着テープ貼付け剥離装置において、前記物品の周囲に位置する部材の表面を難接着面に構成してあることを特徴とする粘着テープ貼付け剥離装置。

【請求項2】 請求項1に記載の粘着テープ貼付け剥離装置において、前記難接着面は、粘着テープ剥離工程でのテープ剥離力が10g／10mm幅以下である粘着テープ貼付け剥離装置。

【請求項3】 請求項1または2に記載の粘着テープ貼付け剥離装置において、前記物品の周囲に位置する部材の表面に非粘着処理を施して難接着面を形成してある粘着テープ貼付け剥離装置。

【請求項4】 請求項1または2に記載の粘着テープ貼付け剥離装置において、前記物品の周囲に位置する部材の表面を粗雑面にして難接着面を形成してある粘着テープ貼付け剥離装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 この発明は、物品とその周囲の部材とに亘って粘着テープを貼付けた後、物品の周囲に位置する部材の表面に貼付けられた余剰の粘着テープを剥離するよう構成した粘着テープ貼付け剥離装置に関する。

【0002】

【従来の技術】 例えば、半導体製造においては、シリコンウェハなどの半導体基板の裏面を研磨（バックグラインド）する際に、基板表面の保護のために粘着テープを貼付ける行程がある。この保護用粘着テープの貼付け行程においては、表面を上向きにして基板を基板支持テーブル上に供給して吸着保持させた状態で、粘着テープを基板上に貼付け、次いで、基板の外周形状に沿って粘着テープを切断し、その後、次の基板への貼付け準備ために、基板の周囲に切り残された余剰粘着テープを一定長さに亘って巻き取る。この場合、テーブル上の基板に粘着テープを貼付けることに伴って、基板の周囲に位置する部材であるテーブル表面にも粘着テープが貼付けられることになるので、余剰粘着テープはテーブル表面から剥離されながら巻き取られことになる。

【0003】

【発明が解決しようとする課題】 上記のようにテーブル上の基板に粘着テープを貼付けて、余剰粘着テープを巻き取る工程において、次のような問題点があった。すなわち、巻き取られる余剰粘着テープは、基板形状に沿って切断された大きい切り抜き孔を有し、切り抜き孔の両横側で幅の狭い側辺でのみ繋がった形状となっているので、余剰粘着テープとテーブル表面との接着が強いと、余剰粘着テープが延びてしまって安定した巻き取りがで

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きなくなったり、テーブルの表面に余剰粘着テープの粘着剤成分が残留し、以後のテープ貼付けおよび剥離の障害となることがあった。

【0004】 本発明は、このような事情に着目してなされたものであって、物品の周囲の部材に貼付けられた余剰の粘着テープを、粘着剤成分を残留させることなく、安定して円滑に剥離することができるようすることを目的とするものである。

【0005】 【課題を解決するための手段】 この発明は、上記目的を達成するために次のような構成をとる。すなわち、請求項1に係る発明は、物品とその周囲に位置する部材とに亘って粘着テープを貼付けた後、物品の周囲に位置する部材の表面に貼付けられた余剰の粘着テープを剥離するよう構成した粘着テープ貼付け剥離装置において、前記物品の周囲に位置する部材の表面を難接着面に構成してあることを特徴とする。

【0006】 請求項2に係る発明は、請求項1に記載の粘着テープ貼付け剥離装置において、前記難接着面は、粘着テープ剥離工程でのテープ剥離力が10g／10mm幅以下であることを特徴とする。

【0007】 請求項3に係る発明は、請求項1または2に記載の発明において、前記物品の周囲に位置する部材の表面に非粘着処理を施して難接着面を形成してある。

【0008】 請求項4に係る発明は、請求項1または2に記載の発明において、前記物品の周囲に位置する部材の表面を粗雑面にして難接着面を形成してある。

【0009】

【作用】 本発明の作用は次のとおりである。請求項1記載の粘着テープ貼付け剥離装置によれば、基板とその周囲に位置する部材とに亘って粘着テープを貼付けた後、不要となった余剰粘着テープを基板の周囲に位置する部材の表面から剥離するに際して、基板の周囲に位置する部材の表面が難接着面に構成されているので、この部材表面に貼付けられた余剰粘着テープは無理に延ばされることなく円滑に剥離される。また、基板の周囲に位置する部材の表面に粘着剤成分が残留することもなくなる。

【0010】 請求項2記載の粘着テープ貼付け剥離装置によれば、基板の周囲に位置する部材の表面が、テーブ剥離力が約10g／10mm幅以下となる難接着面に構成されているので、余剰粘着テープの剥離を一層円滑に行える。

【0011】 請求項3記載の粘着テープ貼付け剥離装置によれば、例えば、シリコン系やフッ素系の離型剤を塗布、あるいはコーティングしたり、フッ素樹脂やシリコングムのシートを貼付けて非粘着層を形成することで、部材表面の非粘着処理を行うことができる。また、非粘着性能が低下すれば再度非粘着処理を行うことで性能を修復することも可能である。

【0012】 請求項4記載の粘着テープ貼付け剥離装置

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によれば、物品表面にプレス加工あるいは切削加工、などの機械的加工を施することで難接着面を形成することができる。

【0013】

【発明の実施の形態】以下、本発明を、半導体基板（物品）Wのバックグラインド工程の前工程として、基板表面に保護用の粘着テープを貼付けるための装置に適用した一実施例を図面を参照して説明する。

【0014】図1に本装置の全体平面図が、図2にその機能部位を示す正面図がそれぞれ示されている。図1、2に示すように、この粘着テープ貼付け剥離装置は、バックグラインド前の基板Wを積層収納したカセットC1が装填される基板供給部1、ロボットアーム2が装備された搬送機構3、基板Wを位置合わせするアライメントステージ4、粘着テープTをテープ貼付け／剥離部位へ供給するテープ供給部5、載置供給された基板Wを吸着保持する基板支持テーブル6、基板支持テーブル6上の基板Wに粘着テープTを貼付けてゆくテープ貼付けユニット7、貼付けた粘着テープTを基板Wの外周形状に沿って切断するテープ切断装置8、基板Wの周囲に切り残された余剰テープTaを剥離するテープ剥離ユニット9、剥離された余剰テープTaを巻き取り回収するテープ回収部10、処理済み基板Wを積層収納するためのカセットC2が装填される基板回収部11、テープ貼付けユニット7およびテープ剥離ユニット9を独立して左右に往復移動させるユニット移動機構12、等が基台13の上部に配備された構造となっている。

【0015】前記基板供給部1は、その表面を上向きにした水平姿勢で基板WをカセットC1に積層収納するようになっており、また、基板回収部2は、レジスト除去処理が済んだ基板Wを同様に水平姿勢でカセットC2に積層収納するようになっている。

【0016】前記搬送機構3のロボットアーム2は水平進退および旋回可能に構成されており、基板供給部1からに基板Wの取り出し、アライメントステージ4への基板Wの供給、アライメントステージ4から基板支持テーブル6への基板Wの搬入、基板支持テーブル6から処理済み基板Wの搬出、および、処理済み基板Wの基板回収部11への搬入、等を行う。

【0017】前記テープ供給部5は、原反ロールRから導出したセバレータ付きテープTsからセバレータSを剥離して巻き取り回収するとともに、下面に粘着面を露出した粘着テープTを基板支持テーブル6の上方を通してテープ貼付けユニット7およびテープ剥離ユニット9にまで導くよう構成されている。

【0018】図3および図4に示すように、基板支持テーブル6の中心には、図外の真空装置に連通接続された吸着パッド14がシリンダ15によって出退昇降可能に装備されるとともに、テーブル上面には、載置された基板Wを真空吸着して保持するための吸着溝16が形成さ

れて図外の真空装置に連通接続されている。また、テーブル上面には載置された基板Wの外周形状に対応したテープ切断用溝17が環状に形成されている。

【0019】テープ貼付けユニット7は、貼付けローラ21を装備した可動台22を、モータ23によって正逆駆動される送りネジ24によって左右水平に一定ストロークで往復移動するよう構成されており、また、テープ剥離ユニット9は、剥離ローラ25を装備した可動台26を、前記送りネジ24の下方に配備した図示しない送りネジによって、テープ貼付けユニット7とは独立して左右水平に一定ストロークで往復移動するよう構成されている。

【0020】本発明に係る粘着テープ貼付け剥離装置の各部は以上のように構成されており、以下に、基板W表面に保護用粘着テープを貼付ける工程を、図5～図10を参照しながら説明する。

【0021】先ず、ロボットアーム2が基板供給部1のカセットC1から基板Wを1枚吸着保持して取り出してアライメントステージ4上に移載し、ここで基板Wのオリエンテーションフラットまたはノッチ等の検出に基づいて、基板Wの位置合わせが行われる。位置合わせが行われた基板Wは再びロボットアーム2に支持されて基板支持テーブル6上に供給される。

【0022】基板支持テーブル6上に搬入された基板Wは、テーブル上に突出している吸着パッド14に受け取られた後、吸着パッド14の下降に伴って基板支持テーブル7の上面に所定の姿勢および位置で載置され、表面が上向きの姿勢で吸着保持される。

【0023】基板支持テーブル6上への基板Wの装填が終了すると、図5および図7に示すように、テープ貼付けユニット7が前進移動し、貼付けローラ21が基板支持テーブル6および基板W上を転動移動して粘着テープTを基板Wの表面に貼付けてゆく。

【0024】基板Wの表面への粘着テープTの貼付けが終了すると、上方待機位置にあったテープ切断装置8が下降し、図8に示すように、カッター8aが基板支持テーブル6上のテープ切断溝17に刃先を突入させた状態を維持しながら基板Wの外周形状に沿って回動し、粘着テープTを基板Wの外周形状に沿って切断する。

【0025】次いで、テープ切断装置8が元の待機位置まで復帰上昇とともに、テープ剥離ユニット9が前進移動を開始し、図9に示すように、剥離ローラ25が基板支持テーブル6および基板Wの上を転動移動することで、基板Wの外形に沿った形状の切り抜き孔hが形成された余剰粘着テープTaが基板支持テーブル6の上面から剥離されてゆく。

【0026】テープ剥離ユニット9がストロークエンドに到達すると、図6および図10に示すように、基板Wの表面には、その外周形状に沿った形状の保護テープTbが貼り残された状態となる。

【0027】その後、保護テープTbが貼付けられた基板Wの搬出が行われるとともに、テープ貼付けユニット7およびテープ剥離ユニット9の後退復帰移動と剥離した余剰粘着テープTaの巻き取り回収が行われる。以上で1回の貼付け工程が終了し、次の基板受入れ待機状態となる。

【0028】上記したテープ剥離工程において、基板支持テーブル6の表面Fに貼付けられた余剰粘着テープTaを剥離する場合、テーブル表面Fと余剰粘着テープTaとの接着力が大きいと、余剰粘着テープTaが延びて安定して剥離できない状態になったり、余剰粘着テープTaの粘着剤成分がテーブル表面Fに残留することがあるが、これを防止するために本発明では余剰粘着テープTaが貼付けられる前記表面F、すなわち、テープ切断溝17より外方におけるテーブル表面Fに非粘着処理を施して難粘着面を構成している。この難粘着面は、好ましくは余剰粘着テープTaが剥離される時の剥離力が10g/10mm幅以下となるように構成される。

【0029】なお、前記剥離力は、被着体へ10mm幅の粘着テープを貼付けた後、100°Cの状態で3分間加熱保持し、剥離角度30°で剥離した場合の接着力を測定した値である。

【0030】ここで、前記テーブル表面Fを難粘着面にするための非粘着処理としては、シリコン系やフッ素系の離型剤を塗布、あるいはコーティングしたり、フッ素樹脂やシリコンゴムのシートを貼付けて非粘着層を形成する手段、などがあり、これらを粘着テープTの粘着力、あるいは、余剰粘着テープTaのテーブル表面Fに対する接着面積、などの使用条件に応じて適宜選択するとよい。また、前記テーブル表面Fを細かい凹凸や細かい溝を有する粗雑面に形成して、粘着テープTとの実質的な接触面積が少ない難粘着面に構成することも可能である。

【0031】また、基板支持テーブル6に冷却装置を内蔵して、テープ切断用溝17の外方における前記表面Fを冷却することで、接触した粘着剤を硬化させて粘着力を低下させる難粘着面に構成することも可能である。

【0032】

【発明の効果】以上の説明から明らかなように、この発明の粘着テープ貼付け剥離装置によれば、以下のような効果が期待できる。

【0033】請求項1に係る粘着テープ貼付け剥離装置によると、基板とその周囲に位置する部材とに亘って粘着テープを貼付けた後、不要となった余剰粘着テープを基板の周囲に位置する部材の表面から剥離する場合、基

板の周囲に位置する部材の表面が難粘着面に構成されているので、この部材表面に貼付けられた余剰粘着テープは無理に延ばされるようなことなく円滑に剥離でき、剥離した余剰粘着テープの回収を安定的かつ容易に行うことができるようになった。また、基板の周囲に位置する部材の表面に粘着剤成分を残留することを防止できるので、繰り返し貼付け剥離処理する場合に、粘着剤成分の残留による貼付け不良の発生などの不具合を未然に防止することができる。

【0034】特に、請求項2に係る粘着テープ貼付け剥離装置によると、粘着テープ剥離工程でのテープ剥離力が10g/10mm幅以下であるように難粘着面が構成されるので、請求項1の発明の効果が一層顕著になる。

【0035】また、請求項3に係る粘着テープ貼付け剥離装置によると、物品の周囲に位置する部材の表面に非粘着処理を施して難粘着面を形成するので、物品表面の非粘着性能が低下しても繰り返して非粘着処理を施すことで性能修復を図ることが容易となり、メンテナンス性に優れたものとなる。

【0036】さらに、請求項4に係る粘着テープ貼付け剥離装置によると、物品表面に機械的加工によって難粘着面を形成することができるので、非粘着処理を施す場合に比較して安価に実施しやすい利点がある。

【図面の簡単な説明】

【図1】本発明に係る粘着テープ貼付け剥離装置の一実施例の平面図である。

【図2】その要部の概略正面図である。

【図3】貼付けテーブルの縦断正面図である。

【図4】貼付けテーブルの斜視図である。

【図5】粘着テープ貼付け工程を示す正面図である。

【図6】粘着テープ剥離工程を示す正面図である。

【図7】粘着テープ貼付け工程の前半を示す斜視図である。

【図8】粘着テープ切断工程を示す斜視図である。

【図9】余剰粘着テープの剥離行程の前半を示す斜視図である。

【図10】余剰粘着テープの剥離工程が終了した状態を示す斜視図である。

【符号の説明】

40 6 部材(基板支持テーブル)

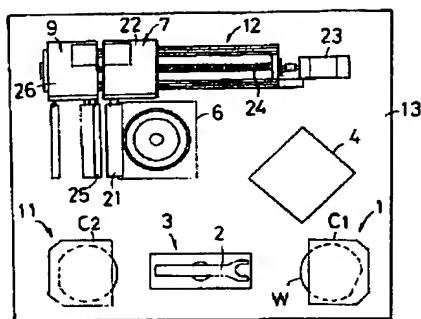
F 表面

T 粘着テープ

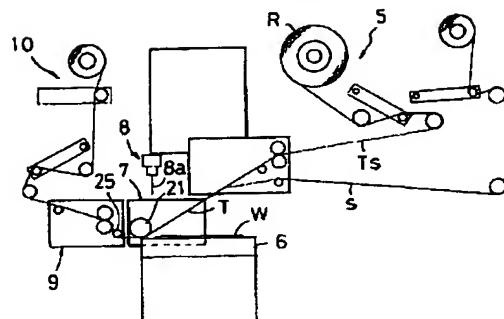
Ta 余剰粘着テープ

W 物品(基板)

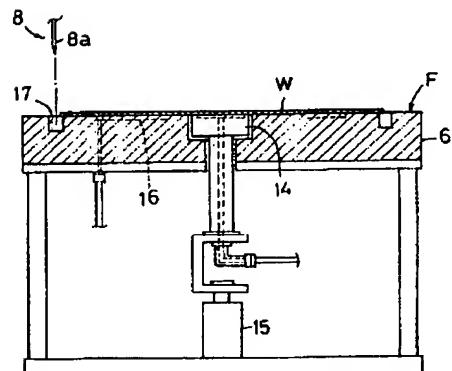
【図1】



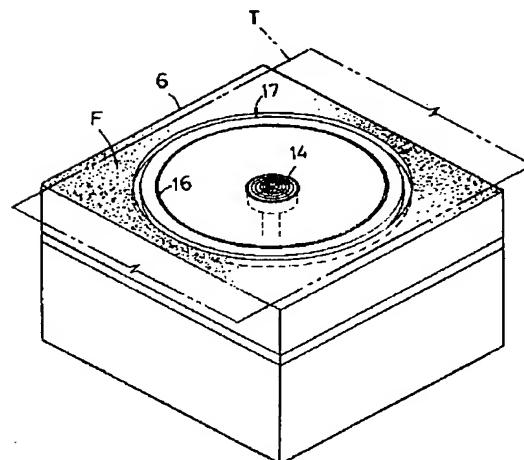
[図2]



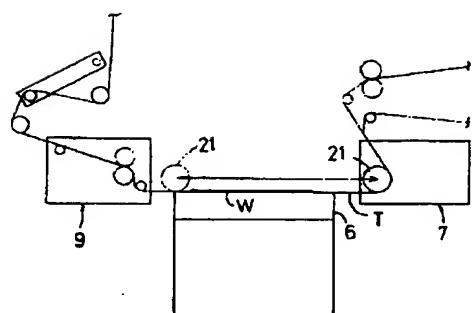
【図3】



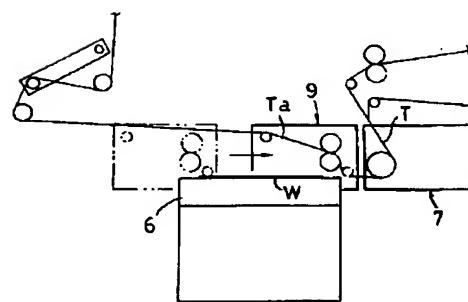
【図4】



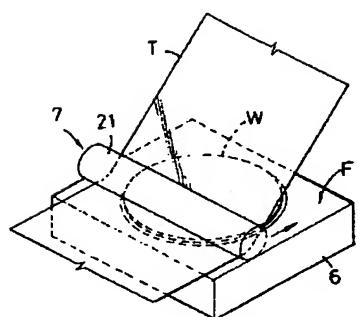
(図5)



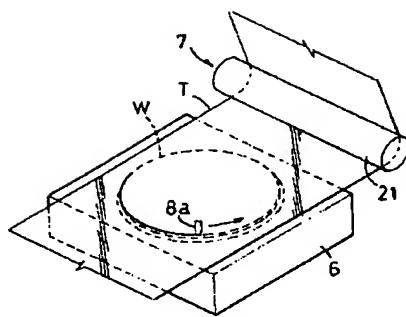
[図6]



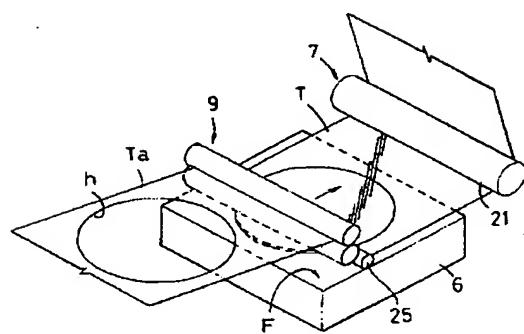
【図7】



【図8】



【図9】



【図10】

